Federal Aviation Administration
APNT Industry Day
Status and Feedback

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Alternative Position, Navigation, and Timing

- In accordance with U.S. National Policy, the FAA needs to ensure a sufficient backup Position, Navigation and Timing (PNT) capability is present to mitigate risks to aviation users if the PNT services provided by GPS become unavailable.
- The FAA's NextGen Alternative PNT (APNT) research initiative ensures that backup PNT services will be available to support flight operations to maintain safety and security while minimizing economic impacts from GPS outages within the National Airspace System (NAS).

Congressional Support

The Joint Explanatory Statement of the Committee of Conference (H.R. 2112) for Fiscal Year 2012:

"Alternate positioning, navigation and timing (APNT).-The conferees understand FAA is conducting a review of APNT capabilities that support communication, navigation, and surveillance applications in the event of a loss of Global Navigation Satellite Services (GNSS) to ensure that operations are appropriately supported and consistent with the evolution to NextGen. The conferees support this review and encourage the FAA to move forward with research, development and potential implementation of systems, avionics, processes, and procedures that leverage available assets to minimize the impact to system capacity and efficiency during periods of GNSS interference."

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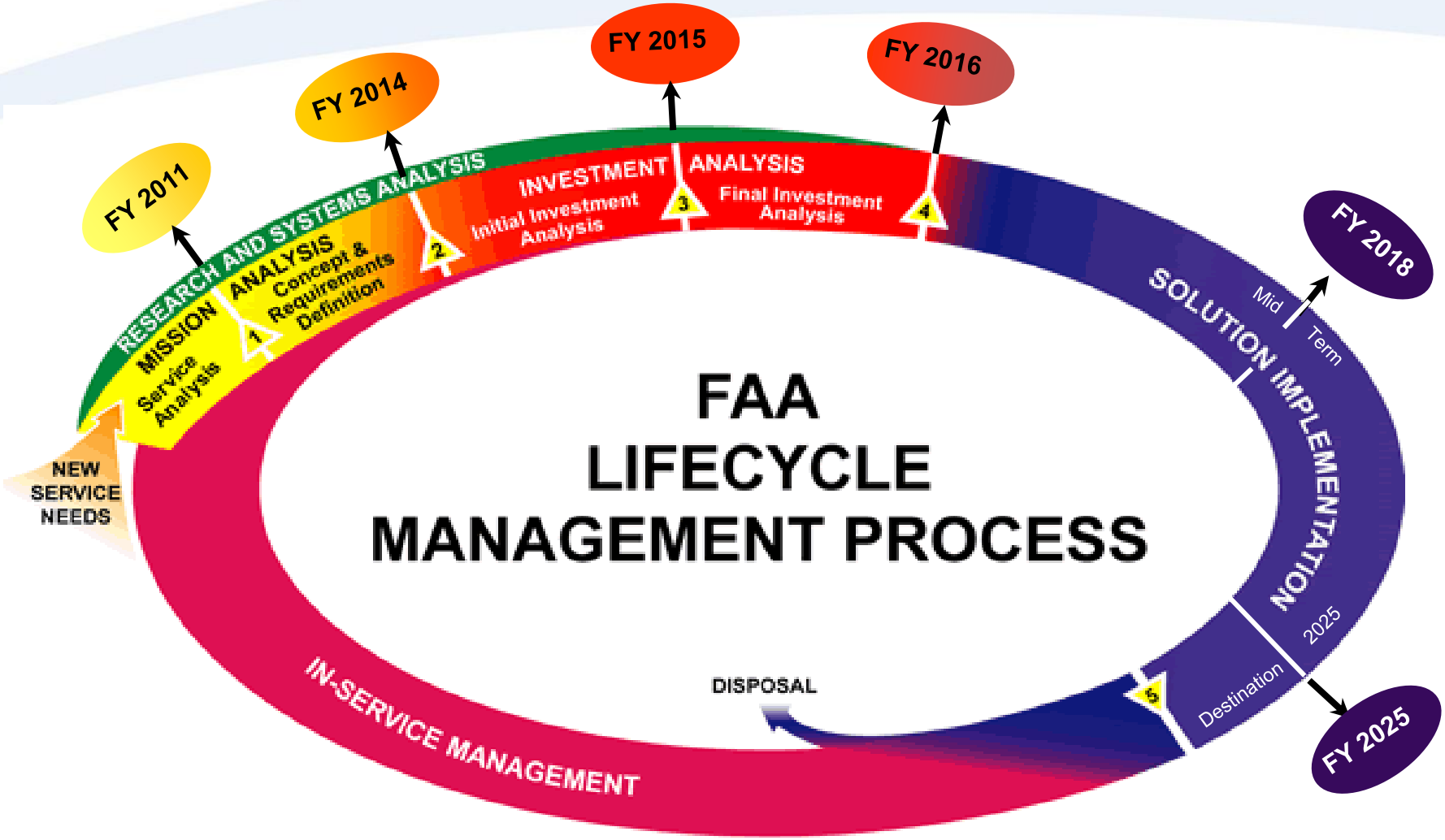
NextGen APNT Roadmap



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APNT Goals and Objectives

- Ensures continuity of operations in NextGen
- Support Performance Based Navigation (PBN) – RNAV/RNP
- Supports Dependent Surveillance Operations (Automatic Dependent Surveillance – Broadcast, both Out and In)
- Supports Trajectory-Based Operations (TBO) and Four Dimensional Trajectories (4DT)
- Supports Users at high density airports: General Aviation, Business, Regional, Air Carrier, and coordination with Military
- Minimizes Impact on User Avionics Equipage by leveraging existing or planned technology
- Support backward compatibility for legacy users
- Minimizes the need for multiple avionics updates for users

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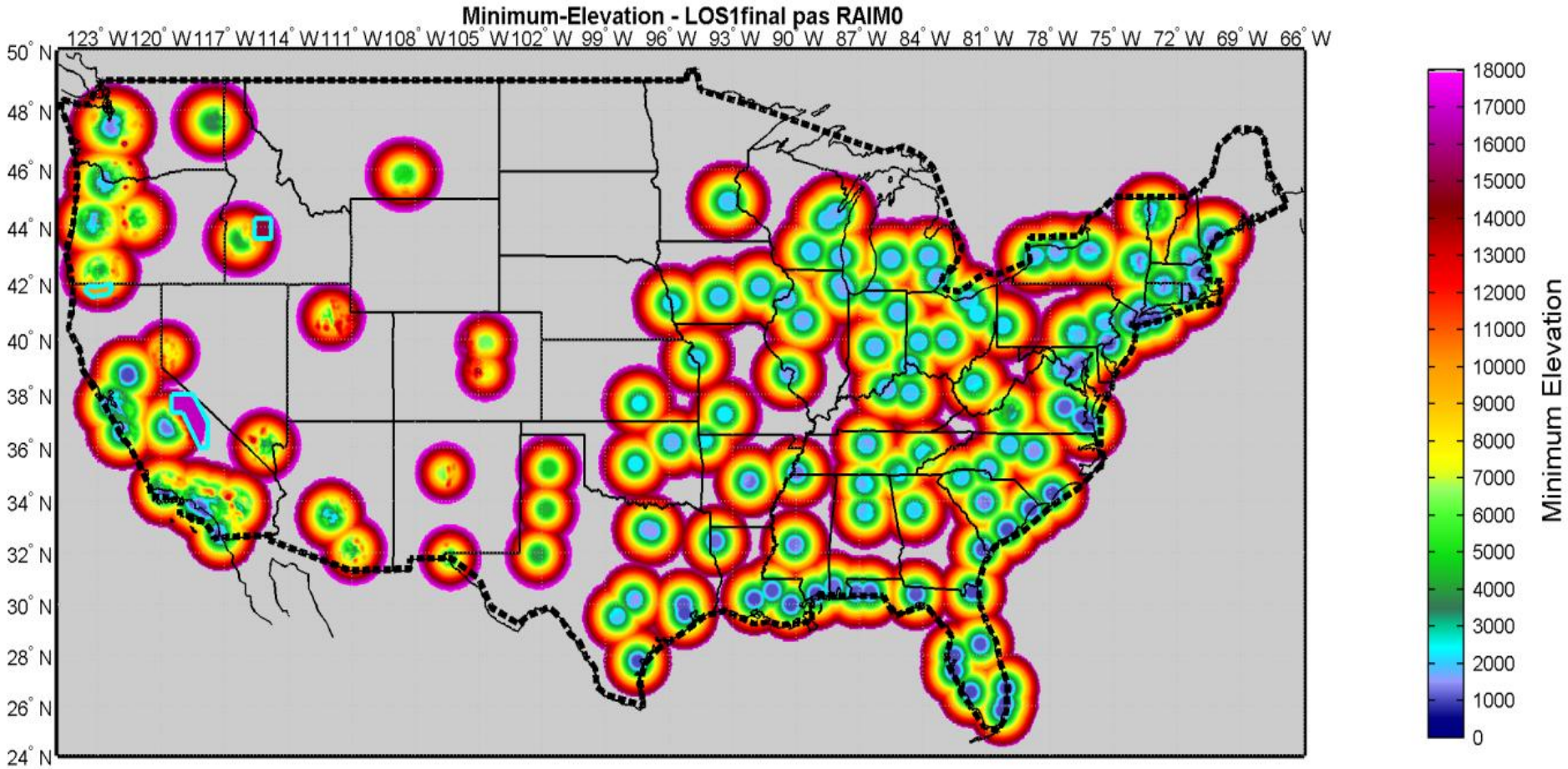
APNT Performance Zones



- Zone 1: En route High CONUS – FL180 ~ FL600
- Zone 2: En route Low CONUS – 5,000' Above Ground Level (AGL) to FL180
- Zone 3: High Density Candidate Airports

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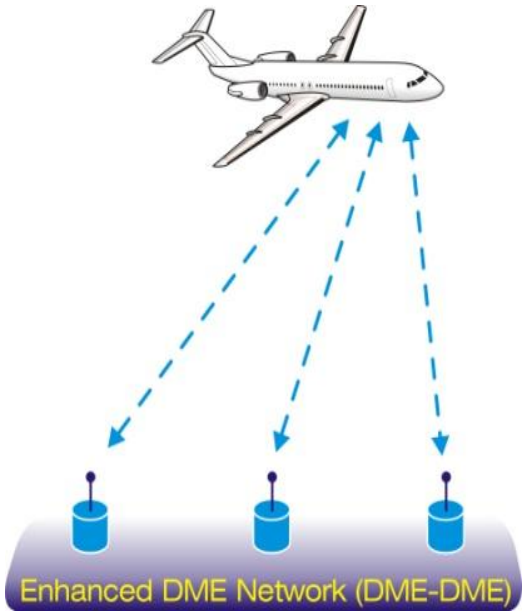
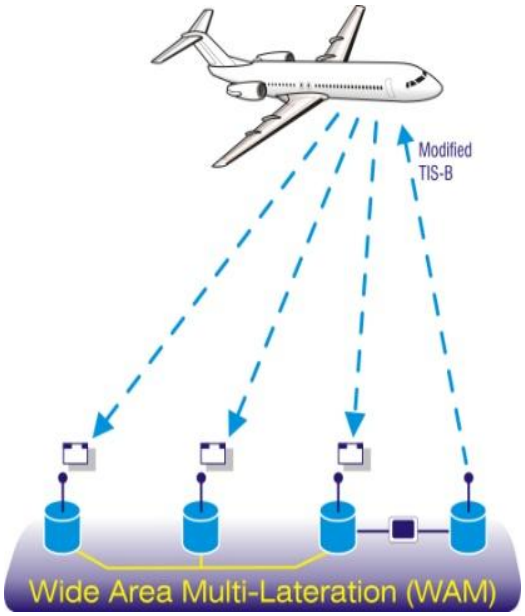
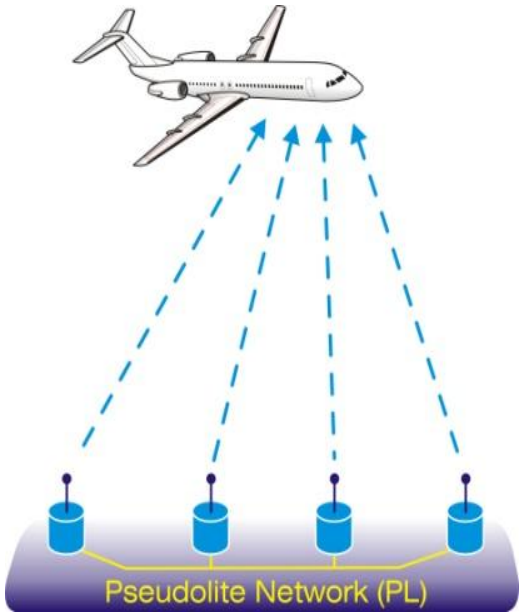
APNT Alternatives



- Leverage existing technology and system
- Least Impact on Avionics
- Evaluating technology opportunities



- Aircraft Uses Own-ship Position for Navigation
- Potential leverage of planned and existing technology and ground infrastructure
- Some impact on Avionics



- Unlimited Capacity
- No existing FAA Standards
- Highest impact on Avionics
- Longest lead time in implementation

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Prior APNT Industry Engagement

- **Feedback**
  - Primary concern is for a low cost solution
  - Minimize aircraft time out of service and impact to avionics
  - APNT Solution:
    - DME/DME is aligned with many Air Carrier equipage
    - A lower cost alternative should be evaluated for General Aviation
    - If new equipage is required, leverage against other requirements and timelines
- **Response**
  - Alternative solutions are being evaluated to balance the best user benefit versus cost and identifying technology limitations or capacity to meet APNT requirements

Other Planned Industry Coordination

- ***Joint Navigation Conference – June 12 ~ 15, 2012***
  - Location: Colorado Springs
  - Audience: Largest U.S. military navigation conference of the year with joint service and government participation
  - Objective: Focuses on technical advances in (PNT) with emphasis on joint development, test and support of affordable PNT systems, logistics, and integration

- ***The Institute of Navigation (ION) Conference – September 17 ~ 21, 2012***
  - Location: Nashville, Tennessee
  - Audience: International GNSS Community
  - Objective: Share and distribute information on current and relevant technology presented by experts in the navigation community

Summary

NextGen APNT Initiative will:

- Sustain safe operation
- Support the transition to Performance Based Navigation (PBN)
- Enable continuous operations during GPS outages
  - RNAV Everywhere, RNP where beneficial
  - Dependent Surveillance Operations
  - Trajectory-Based Operations (TBO)
- Minimizes Impact on User Avionics Equipage
  - Leveraging existing or planned equipage as much as possible
  - Supporting backward compatibility for legacy users
  - Minimizing need for multiple avionics updates for users
- Leverages use of existing or planned NAS infrastructure
- Provide best value for the FAA and users

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